NOTES ON CLIMATOLOGY.

BY

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LOSS OF LIFE IN THE UNITED STATES BY LIGHTNING.—In 1890 the Weather Bureau began a statistical inquiry as to the number of fatalities caused by lightning in the United States, and this investigation was continued to the close of the year 1900. Considerable difficulty was naturally experienced in securing reliable data, but every effort was made to have the information as accurate as possible. The results for the earlier years were much more unreliable than those for the later ones, the data for 1899 and 1900 being especially complete. In a recent Bulletin of the Weather Bureau (No. 30. *Loss of Life in the United States by Lightning*) Professor A. J. Henry summarizes the statistics thus far gathered, and considers the geographical distribution of lightning strokes—a subject which he also treats cartographically for the first time.

During the year 1900, 713 persons were killed by, or received fatal injuries through, lightning. Of this number, 291 persons were killed in the open, 158 in houses, 57 under trees, and 56 in barns. The circumstances attending the death of the remaining 151 are not known. Nine hundred and seventy-three persons were more or less injured by lightning during the year, and of this number 327 received their injuries while in houses, 243 in the open, 57 in barns, and 29 under trees. The circumstances attending the injury of the remaining 317 cases are not known. On the average, it is probable that from 700 to 800 lives are lost each year by lightning in the United States.

Tabulating the average mortality resulting from lightning according to geographic districts having the same, or nearly the same, atmospheric conditions, it appears that the greatest number of fatalities occurred in the Middle Atlantic States; the next greatest in the Ohio Valley and Tennessee, with the middle and upper Mississippi Valley a close third. The greatest number of deaths in any single State during the next five years, 1896–1900, occurred in Pennsylvania (186), followed by Ohio with 135, and Indiana, Illinois, and New York with 124 each.

The average number of deaths from lightning per unit area (10,000 sq. miles) is 1 in the Gulf States. In New England, with

probably half as many thunderstorms, the death-rate per unit area is 2. In the latter district the death-rate per million of rural inhabitants is nearly double that per million of total population, and the same holds true of the densely-populated districts of the Middle Atlantic States. Considering both unit area and density of population, the greatest mortality from lightning is in the Ohio Valley and the Middle Atlantic States. If, however, the density of population alone be considered, it is in the upper Missouri Valley and the middle Rocky Mountain region.

The *Bulletin* also gives a brief discussion of thunderstorms in general, especially as related to their electrical phenomena, and calls attention to a few simple precautions against danger that may be exercised by the individual.

THE AGRICULTURAL POSSIBILITIES OF ALASKA.—Increasing attention is being paid to the future possibilities of the great Territory of Alaska, and one of the questions of most interest in this connection concerns the agricultural outlook in that region. Can Alaska ever become a farming country, or is its commercial value to lie altogether in its mines, its fisheries, and its animal life? To the climatologist the agricultural problem is naturally the one of greatest concern. Two rather divergent views on this subject are presented in the March number of the National Geographic Magazine. In an article on *The Possibilities of Alaska*, by C. C. Georgeson, Special Agent of the Department of Agriculture in Charge of Alaska Investigations, the writer gives an enthusiastic account of the success which he finds to have attended farming ventures in different parts of the Territory. Cattle feeding in grass so tall that it reached above their backs; magnificent native-grown potatoes, carrots, beets, cauliflowers, peas, lettuce and radishes, and normal wheat, oats, barley, and rye were seen during the summer. Mr. Georgeson states that hardy vegetables are successfully raised all over Alaska south of the Arctic Circle, except on the coast of Bering Sea, and concludes by comparing the future agricultural conditions of Alaska with those of Finland at the present time, the former region having, in the opinion of Mr. Georgeson, more favourable conditions from an agricultural standpoint than the latter.

A more conservative view, and one which those who have made a study of the climate of Alaska will be more ready to accept, is that of Mr. Henry Gannett, as set forth in a brief note on *Agriculture in Alaska* in the same number of the National Geographic

Magazine. Mr. Gannett sums up the whole matter in the following words, which are here quoted because they so well express what may be called the reasonable scientific view of the matter:

> While it is admittedly true that hardy grains and vegetables have been brought to maturity at various points on the coast and in the interior, the climate must always prevent this northwestern territory from becoming a successful farming region. To be successful farm products must be grown at a less expense than they can be raised in California, Oregon, or Washington, *plus* the cost of transportation. We do not think that Professor Georgeson would maintain that farmers upon the Alaskan coast could compete in their home markets with the Pacific States. In the interior of Alaska, where climatic conditions are more favorable than upon the coast, the summers being hotter and less moist, and where home products would be protected by higher transportation rates, it may be possible to maintain successful competition—although that is a matter yet to be demonstrated.

CLIMATE OF WESTERN AUSTRALIA.—A publication of considerable importance to climatologists is that on *The Climate of Western Australia*, recently issued from the Perth (W. A.) Observatory by W. Ernest Cooke, Government Astronomer for Western Australia. This is the first comprehensive report on the climate of this region. Annual meteorological summaries have been issued since 1876, but the present volume comprises a selection and co-ordination of the principal meteorological facts which have been discovered during the past twenty-four years of observation. A large number of tables are given showing the monthly and annual means and extremes of the different meteorological elements, and the distribution of these elements is also shown by maps. The records naturally refer mostly to stations in the vicinity of the coast, the inland districts being still to a great extent unrepresented. A series of seventeen weather maps illustrates the weather types of the district under consideration. There are two distinct types of weather—the winter and the summer—although each of these is, of course, subject to almost endless modification. Among the tables one of special interest shows the duration of the "heat waves" which have passed over Perth since Jan. 1, 1880. The longest of these spells without a break occurred in 1896, when the maximum temperature exceeded 90° on every day between January 25 and February 12, nineteen days in all; but the most severe heat was apparently in January and February, 1880, when the maxima on several days rose over 100°, and on two days over 110°. It may be noted, however, that hot nights are exceptional, even during these hot waves, the minima being usually between 60° and 70°.

The heaviest fall of rain ever recorded in Western Australia was

36.49 inches, near Cossack, April 2–3, 1898. On the other hand, only 0.73 inch was recorded in this same district during twenty months ending January, 1892.

SOME PHYSIOLOGICAL EFFECTS OF SUNSHINE AND SHADE.—It has long been well known that differences in exposure to sunshine have marked effects upon vegetation, but hitherto practically no attention has been paid to any effects which may be noted upon the characteristics of the human beings who live under different conditions of insolation in the same general district. Some very interesting facts in this connection are brought out in a recent paper by M. Lugeon, professor at the University of Lausanne, entitled *Quelques Mots sur le Groupement de la Population du Valais* (Etrennes helvétiques pour 1902). A study of the principal valley of the canton, between Martigny and the Rhone Glacier, brings out some evident effects of exposure. Statistics show a population of about 20,000 on the left bank and 34,000 on the right bank of the river. A part of this difference is doubtless due to the fact that the right bank is less steep, and hence more open to settlement, but the major part is believed by M. Lugeon to result from the difference in the exposure to sunshine. In a certain district in this same valley the slopes on both sides are about equally steep, but the population on the sunny side is about 3,000, while that on the shady side is between 700 and 800. With one or two exceptions all the villages are on the sunny side. In fact, a certain distinction of classes results from this difference in the conditions of insolation. There is developed an aristocracy of the sun, so to speak. The people who live on the sunny side are, on the whole, more prosperous and better educated. They of the *Sonnenseite* look with some contempt upon the poorer people on the *Schattenseite*. The village of Reckingen contains two real castes, the distinction between which rests ultimately upon the difference in exposure to sunshine.

THE MEXICAN BELT OF CALMS.—In the region east of the 120th meridian, in the North Pacific Ocean, and between the coast of Central America and Mexico and the Equator, there is a belt of calms and of variable winds which is a source of great delay to all sailing vessels which have occasion to pass over that portion of the ocean. This belt is called the Mexican Belt of Calms. It forms part of the general equatorial belt of low pressure which encircles the globe, and it lies between the anticyclones of the North and

South Pacific Oceans. On the *Pilot Chart of the North Pacific Ocean for April*, Mr. James Page considers this Mexican belt of calms, and gives charts showing, for winter and summer, the percentage of calms and light winds for each 5-degree square throughout the area in question. The shape of the belt is generally triangular, the base resting on the American coast and stretching from Cape San Lucas to the Gulf of Panama. The vertex is in longitude 120°–125° W., and in a latitude varying with the season, being further north in summer and further south in winter. The percentage of calms and of light airs is always greater near the coast, but close alongshore the prevailing land and sea breezes serve to diminish the frequency of calms, and may be taken advantage of by vessels making trips between the coast ports of Mexico and Central America. The occurrence of these land and sea breezes, although such winds are of minor importance in the general wind system of the world as a whole, is thus very helpful to navigators in this particular ocean area.